This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2023 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
1	**Two** from: • Check digit • Range check • Character/type check • Length check • Type check	**2**

Question	Answer	Marks
2(a)	Section break	**1**
2(b)	**Two** from, for example: • Png • Gif • Jpg/Jpeg • Bmp • PDF • IMG	**2**
2(c)	**Three** from: • Information is repeated on each page • Allows easier navigation in the document • Saves time for the user to add information manually • Information only needs to be entered once	**3**

Question	Answer	Marks
3(a)	A Text B Number/Integer C Date D Currency	**4**
3(b)	**Four** from: • They can be read from many angles • The physical size of the QR can be small therefore takes up less space on the box • Can be used to track stock • Can contain links to more information about the products • It contains information about the product • Can be read by any device with a camera and suitable software	**4**
3(c)	**Two** from: • Brackets/parentheses missing around B2-C2 • Multiplication was carried out first then the subtraction • The order of calculation should follow BODMAS/BIDMAS/PENDAS	**2**

Question	Answer	Marks
4(a)	**Six** from: • User IDs and passwords combined protect against unauthorised access Combined user ID and password is unique to the computer system. • The user ID ensures the correct account is accessed, the password then protects the account • If someone knew the user ID they could only gain access with the correct password • Typing in incorrect user ID/password a number of times could lock the user out • User IDs give different access levels in the computer system • User IDs are unique and allow the system manager to monitor usage on the system • The password is masked and displayed as stars • A strong password is a combination of upper and lower case characters/numbers/symbols • Passwords could be biometrics ensuring greater security • Passwords increase security as they are only known by the user	**6**
4(b)	**Description** **Two** from: • Uses parts of the body/physical attributes as a password • Unique to the user • Form of authentication **Examples** **Two** from, for example: • Fingerprint • Retina • Voice • Face	**4**

Question	Answer	Marks
5	**Six** from: **Laptop with SSD** • Data can only be accessed on the laptop if laptop breaks there is no access • The user retains control over the data stored • Greater security as data is always with you • After the initial cost of the laptop there is nothing else to pay for storage **Cloud storage laptop** • Requires an internet connection to store/read/access data the internet connection should be stable • More storage available • Can be more expensive as storage needs to be bought • The data is available on other devices if the laptop breaks • Automatic backup of data so less chance of losing data • Can be issues if the internet drops during storing of data **To gain full marks the evaluation must have both Laptop with SSD and Cloud storage laptop**	**6**

Question	Answer	Marks
6	**Six** from: *Benefits* • Cheaper than building a physical bridge • Safer as the bridge could collapse if not tested properly • Safer to check environmental factors • Tests can be carried out with extreme weather conditions *Drawbacks* • Too many variables to cover them all • Requires programmers/hardware/software to create the model can increase costs • Requires extra skilled staff to maintain the model • Errors in the software can cause catastrophic effects **To gain full marks the discussion must have both benefits and drawbacks** **If a list give five marks maximum**	**6**

Question	Answer	Marks
7(a)	**Two** from: • Mixture of Virtual reality and Augmented reality • Combines real/physical world with digital world and interacts with each • Allows seamless interaction between the real and virtual worlds	**2**
7(b)	**Six** from: The manufacture of components is cheaper The whole process of setting up and printing the components can be quicker Quality is consistent Minimises waste Fewer sub-components making it stronger and safer The size of the component is limited to the size the 3D printer can product If the initial design is incorrect it is harder to correct Initial cost of the printer could be more costly Requires skilled programmers/operators therefore the initial costs could be higher	**6**

Question	Answer	Marks
8(a)	**Four** from: **Benefits** • Cameras can be viewed from the smartphone so intruders can be seen/reported • Increased sense of security • You receive immediate alerts if there is a security breach **Drawbacks** • You may not be able to deal with the intruders if you are a long way away • The wireless technology/data could be accessed by hackers • If access to the internet is lost then control of the system is lost **To gain full marks there needs to be both benefits and drawbacks**	**4**
8(b)	**Two** from: • Light • Temperature • Motion • Proximity/Passive Infra-red/PIR • Pressure pads • Acoustic/Sound	**2**
8(c)	**Four** from: • An image is taken of the front of the vehicle • The image is sent to the software • The software isolates the number plate from the image • Colour brightness and contrast are changed this makes the plate easier to read • Each character is read/decoded using OCR software • The number plate is searched in the database • Comparison is made with number plates stored in the database • If the number plate is identified it allows the gate to open	**4**
8(d)	**Three** from: • Another vehicle/pedestrian could obstruct the view of the camera • The number plate may be too dirty to read • The number plate may be in low light/poor weather conditions • The number plate may use illegal characters/font • The number plate could be in a different position than where it should be • Characters are misread • Position of characters/grouping of characters • The number plate has not been added to the system	**3**

Question	Answer	Marks
9(a)	**Six** from: *Age:* • Balance of text and images to attract older audience • Uncluttered // Use of white space // Organised layout • Don't use childish language **Consistent design** *Interests:* • Interesting content • Keep on topic • Knowing the audience's interests and writing about them *Accessibility:* • Contrasting colours to make it easier to read • Clear (readable) fonts • Larger fonts to help those with visual impairments • Keep the content simple • Interactivity • Don't use red and green due to colour blindness	**6**
9(b)	**Three** from: • Provides consistency • Allows all documentation to contain the same header/footer information • Saves money/time on producing new documentation details • People using the web pages know it is part of the university website • Relates to the university identity/brand image	**3**
9(c)	**Four** from: • Corporate colours used • Corporate font style • Corporate font size • Inclusion of the logo • Position of the logo • Position of text • Layout of address	**4**

Question	Answer	Marks
10(a)(i)	Interview	**1**
10(a)(ii)	Observation	**1**
10(a)(iii)	Questionnaires	**1**
10(b)	**Three** from: • Data structure • Input format • Output format • Validation routine	**3**